CLAIMS

What is claimed is:

1.   A method of accessing segments in data storage systems, the method comprising:

coalescing a plurality of extents in a segment into a plurality of groups based on data storage device location; and

submitting a single I/O operation for each group of extents.

2.   The method of claim 1, wherein at least one of the I/O operations returns one or more extents that are not in the segment.

3.   The method of claim 1, wherein the plurality of extents coalesced is only a portion of the extents in the segment.

4.   The method of claim 3, wherein the number of extents in the portion of the segment coalesced is user-defined.

5.   The method of claim 1, further comprising:

partitioning at least one of the plurality of groups into two or more groups.

6.   The method of claim 5, wherein partitioning of the at least one group is based on size.

7.   The method of claim 6, wherein the size is dictated by system limits.

8.   The method of claim 5, wherein partitioning of the at least one group is based on performance.

9.   The method of claim 1, further comprising:

scheduling the I/O operations to overlap with CPU activity.

10.   The method of claim 9, wherein the I/O operations are scheduled to ensure that the CPU is not idle while an I/O operation is executing.

11.   The method of claim 9, further comprising:

collecting information on CPU activity and I/O operations; and

adjusting the scheduling of the I/O operations based on the collected information.

12.   The method of claim 1, wherein at least two of the plurality of extents in the segment differ in size.

13.   A computer program product that includes a computer readable medium, the computer readable medium comprising instructions which, when executed by a processor, causes the processor to execute a process for accessing segments in data storage systems, the process comprising:

coalescing a plurality of extents in a segment into a plurality of groups based on data storage device location; and

submitting a single I/O operation for each group of extents.

14.   The computer program product of claim 13, wherein at least one of the I/O operations returns one or more extents that are not in the segment.

15.   The computer program product of claim 13, wherein the plurality of extents coalesced is only a portion of the extents in the segment.

16.   The computer program product of claim 15, wherein the number of extents in the portion of the segment coalesced is user-defined.

17.   The computer program product of claim 13, wherein the process further comprises:

partitioning at least one of the plurality of groups into two or more groups.

18.   The computer program product of claim 17, wherein partitioning of the at least one group is based on size.

19.   The computer program product of claim 18, wherein the size is dictated by system limits.

20.   The computer program product of claim 17, wherein partitioning of the at least one group is based on performance.

21.   The computer program product of claim 13, wherein the process further comprises:
        scheduling the I/O operations to overlap with CPU activity.

22.   The computer program product of claim 21, wherein the I/O operations are scheduled to ensure that the CPU is not idle while an I/O operation is executing.

23.   The computer program product of claim 21, wherein the process further comprises:
        collecting information on CPU activity and I/O operations; and
        adjusting the scheduling of the I/O operations based on the collected information.

24.   The computer program product of claim 13, wherein at least two of the plurality of extents in the segment differ in size.

25.   A system for accessing segments in data storage systems, the system comprising:
        means for coalescing a plurality of extents in a segment into a plurality of groups based on data storage device location; and
        means for submitting a single I/O operation for each group of extents.

26.   The system of claim 25, wherein at least one of the I/O operations returns one or more extents that are not in the segment.

27.   The system of claim 25, wherein the plurality of extents coalesced is only a portion of the extents in the segment.

28.   The system of claim 27, wherein the number of extents in the portion of the segment coalesced is user-defined.

29.   The system of claim 25, further comprising:

       means for partitioning at least one of the plurality of groups into two or more groups.

30.   The system of claim 29, wherein partitioning of the at least one group is based on size.

31.   The system of claim 30, wherein the size is dictated by system limits.

32.   The system of claim 29, wherein partitioning of the at least one group is based on performance.

33.   The system of claim 25, further comprising:

       means for scheduling the I/O operations to overlap with CPU activity.

34.   The system of claim 33, wherein the I/O operations are scheduled to ensure that the CPU is not idle while an I/O operation is executing.

35.   The system of claim 33, further comprising:

       means for collecting information on CPU activity and I/O operations; and

       means for adjusting the scheduling of the I/O operations based on the collected information.

36.   The system of claim 25, wherein at least two of the plurality of extents in the segment differ in size.